

CLAIMS:

1. A vacuum pump comprising:

5 a main pump, wherein the main pump has a first housing
and a first pump mechanism accommodated in the first housing,
the first pump mechanism being of a multi-stage type;

a booster pump, wherein the booster pump has a second
housing and a second pump mechanism accommodated in the
second housing, wherein the booster pump and the main pump
10 are coupled in series such that gas is sent from the booster
pump to the main pump; and

a coupling member for coupling the first housing and
the second housing to each other, wherein the coupling
member is directly coupled to a portion of the first housing
15 that surrounds a last stage of the first pump mechanism such
that transmission of heat to the portion is permitted.

2. The vacuum pump according to claim 1, wherein the
coupling member is integrally formed with at least one of
20 the first housing and the second housing.

3. The vacuum pump according to claim 1, wherein the
coupling member is formed separately from the first housing,
and wherein the coupling member abuts on an outer surface of
25 the portion of the first housing that surrounds the last
stage of the first pump mechanism.

4. The vacuum pump according to claim 3, wherein a
thermal-conductance improver is provided at the joint
30 between the coupling member and the first housing.

5. The vacuum pump according to claim 4, wherein the
thermal-conductance improver is located between the coupling
member and the first housing such that adhesion of the
35 coupling member to the first housing is improved.

6. The vacuum pump according to claim 1, wherein the coupling member supports one of the main pump and the booster pump such that the supported pump is located above the other pump.

7. The vacuum pump according to claim 1, wherein the coupling member has a communication passage, wherein the communication passage connects a gas exhaust port of the booster pump to a gas suction port of the main pump.

8. The vacuum pump according to claim 1, wherein the gas is a gaseous reaction product generated at a semiconductor machining apparatus.

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9. A vacuum pump comprising:

a main pump, wherein the main pump has a first housing and a first pump mechanism accommodated in the first housing, the first pump mechanism being of a multi-stage type;

20 a booster pump, wherein the booster pump has a second housing and a second pump mechanism accommodated in the second housing, wherein the booster pump and the main pump are coupled in series such that gas is sent from the booster pump to the main pump; and

25 a coupling member for coupling the first housing and the second housing to each other, wherein the coupling member has a first portion and a second portion, wherein the first portion forms a gas passage for guiding gas from the booster pump to a foremost stage of the first pump mechanism, and the second portion extends from a portion of the first housing that surrounds the foremost stage of the first pump mechanism to a portion of the first housing that surrounds a last stage of the first pump mechanism, and wherein the second portion is directly coupled to the portion of the first housing that surrounds the last stage of the first

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pump mechanism such that transmission of heat to the portion is permitted.

10. The vacuum pump according to claim 9, wherein the
5 second portion of the coupling member is integrally formed with the first housing.

11. The vacuum pump according to claim 9, wherein the
10 second portion of the coupling member is formed separately from the first housing, and wherein the second portion abuts on an outer surface of the portion of the first housing that surrounds the last stage of the first pump mechanism.

12. The vacuum pump according to claim 9, wherein a
15 thermal-conductance improver is provided at the joint between the coupling member and the first housing.

13. The vacuum pump according to claim 12, wherein the
20 thermal-conductance improver is located between the coupling member and the first housing such that adhesion of the coupling member to the first housing is improved.

14. The vacuum pump according to claim 9, wherein the
25 coupling member supports one of the main pump and the booster pump such that the supported pump is located above the other pump.

15. The vacuum pump according to claim 9, wherein the gas
30 is a gaseous reaction product generated at a semiconductor machining apparatus.